III.B.2.N.d. Temporarily flooded cold-deciduous shrubland

III.B.2.N.d.9. ALNUS INCANA TEMPORARILY FLOODED SHRUBLAND ALLIANCE

Speckled Alder Temporarily Flooded Shrubland Alliance

ALNUS INCANA / MESIC GRAMINOIDS SHRUBLAND

Speckled Alder / Mesic Graminoids Shrubland

ELEMENT CONCEPT

GLOBAL SUMMARY: This shrubland association is a widespread community of limited extent in the western states of Idaho, Colorado, Utah, Wyoming, and Nevada. Stands occur in narrow to moderately wide floodplains on stream benches, in association with abandoned meanders, on islands and pointbars, and on hillside seeps. These shrublands are characterized by stands of medium-tall and tall, deciduous shrubs and a thick herbaceous undergrowth of wetland-indicator grasses, and little to no overstory tree canopy. Total shrub cover is usually over 50% and is dominated by *Alnus incana*, the diagnostic shrub. Other shrubs includes *Salix* spp., *Betula occidentalis*, and *Cornus sericea*. The understory of undisturbed stands has a dense herbaceous cover including *Glyceria* spp., *Calamagrostis canadensis, Elymus glaucus, Carex* spp., and *Equisetum* spp. Heavily disturbed stands have abundant non-native grasses. In Nevada, Utah, southeastern Idaho, and Wyoming, this type is considered a grazing-induced community derived from *Alnus incana* / Mesic Forbs Shrubland (CEGL001147). However, several stands in Colorado are undisturbed and the undergrowth is dominated by native graminoid cover.

ENVIRONMENTAL DESCRIPTION

USFWS Wetland System: PALUSTRINE

Florissant Fossil Beds NM Environment: This shrubland occupies two small, west-flowing drainages at moderate elevations in the monument. The drainages differ in that the northernmost drainage and upper southernmost are low-gradient and support stands of sedge and willow, while the lower portion of the southernmost drainage is steep, narrow, and incising (approximately 4–5 m deep through loose gravel alluvium). The stand of *Alnus incana* located in the incised drainage portion is showing stress from drought and fire, e.g., stunted growth, many dead stems/shrub bases, and many new root sprouts, while those of more mesic sites appear healthy. The more stressed stand also exhibited chewing and other bark damage from elk, much like that observed in quaking aspen stands.

Global Environment: Stands occur in narrow to moderately wide floodplains on stream benches, in association with abandoned meanders, on islands and pointbars, and on hillside seeps. *Alnus incana* tends to dominate narrow streambanks where stream gradients are relatively steep, or on more cobbly substrates than their willow neighbors in broad floodplain settings. Stream channels can be steep and straight to highly sinuous (Rosgen's Channel Type: A3, A4, F3) or moderately steep and sinuous (Rosgen's Channel Type: B2, B3, B4, B6) (Rosgen 1996). Where this association occurs on point bars, stream channels are low gradient (<1% gradient) and highly sinuous (Rosgen's Channel Type: C5) (Rosgen 1996). Soils are mostly coarse alluvium, but characteristically have silt loams or sandy clay loams at the surface with a high percentage of organic matter. Soils are shallow to moderately deep, 15-30 inches (35-62 cm), and become increasingly skeletal with depth. Most profiles have 10-50% mottles at 7-10 inches (18-25 cm) depth. One profile had gleyed, mineral soils indicating saturated conditions.

VEGETATION DESCRIPTION

Florissant Fossil Beds NM Vegetation: This shrubland occurs in small patches and linear stands (stringers along drainages) that are less than 15 m wide and from 25–75 m in length. The stands are associated with species of willow (*Salix exigua, Salix monticola*, and *Salix ligulifolia*) and water birch (*Betula occidentalis*) providing a total shrub cover of approximately 35–45%. The shrubs may be quite tall, from 5–15 m depending on the stand health and site location. Stands located on mesic sites with sedge species in the understory appeared healthier and more robust than those of the drier, incised drainage reach. The oldest individual *Alnus incana* stems were associated with the upper portion of the driest site, in association with a quaking aspen stand, and trunk diameters up to 16.5 cm were recorded for the large alders. Graminoids associated with *Alnus incana* stands were tall, from 1–2 m and provided from 40–50% foliar cover. The most common graminoid species present included *Carex nebrascensis, Carex utriculata, Carex aquatilis*, and *Juncus balticus* and the exotics *Poa pratensis* and *Phalaris arundinacea*. Forbs associated with *Alnus incana* stands also ranged from 1–2 m in height and contributed approximately 20% foliar cover. The most common forbs present included *Heracleum maximum, Mertensia ciliata, Mentha arvensis*, and *Cirsium scariosum (= Cirsium tioganum)*. Ground cover consisted of predominantly herbaceous litter (60–90%), which was very thick (up to 10 cm at some locations) and litter in the form of wood (approximately 8–20%).

The patches and stands of this shrubland are less than the project minimum mapping unit and are typically associated with willow shrubs. The signature of this association is the same as that for willow stands, i.e., black to dark green for true color and bright pink to red for CIR.

Global Vegetation: These shrublands are characterized by stands of medium-tall and tall, deciduous shrubs and a thick herbaceous undergrowth of wetland-indicator grasses, and little to no overstory tree canopy. Total shrub cover is usually over 50% and is dominated by *Alnus incana*, the diagnostic shrub. *Alnus incana ssp. tenuifolia* dominates the upper canopy with 10-90% cover. Other shrubs occasionally present include *Salix exigua*, *Salix monticola*, *Rubus deliciosus*, *Salix bebbiana*, *Salix drummondiana*, *Rosa woodsii,* and *Cornus sericea*. Occasionally, trees may be scattered throughout the shrubland, or occur along one edge. Tree species include *Populus deltoides ssp. monilifera* and *Salix fragilis*.

The undergrowth is a thick carpet of grasses. Native graminoids include *Calamagrostis canadensis*, *Carex utriculata*, *Glyceria striata*, *Carex aquatilis*, *Carex lanuginosa*, and *Festuca rubra*. Heavily disturbed stands are dominated by introduced, non-native grasses including *Poa pratensis*, *Agrostis stolonifera*, and *Bromus inermis*. Forb cover is usually low relative to the amount of graminoid cover, but can include a high variety of species, including *Mertensia ciliata*, *Mentha arvensis*, *Cardamine cordifolia*, and *Caltha leptosepala*.

Global Dynamics: *Alnus incana ssp. tenuifolia* is a long-lived, early-seral species. It is one of the first species to establish on fluvial or glacial deposits as well as the spoils of placer mining (Viereck 1970, Van Cleve et al. 1971, Chapin et al. 1994, Hansen et al. 1989). After establishment, young stands of *Alnus incana* are continually flooded. As stands mature, the stems can slow flood waters and trap sediment. Fine-textured sediments accumulate on top of the coarser alluvial material and the land surface eventually rises above annual flood levels. Flooding is then less frequent and soils begin to develop (Padgett et al. 1989).

Alnus incana is shade-intolerant (Viereck 1970, Chapin et al. 1994), and many mature stands in Colorado are restricted to stream bank edges, possibly because these are the only sites where light can penetrate the neighboring overstory canopy. *Alnus incana* has been observed on high-gradient streams and is thought to require well-aerated water (Hansen et al. 1988b, Padgett et al. 1989).

Undisturbed *Alnus incana* stands may become dominated by *Salix* (willow) species or conifer stands (Hansen et al. 1989). In Alaska, thick stands of alders inhibit succession by competing with spruce for nutrients and light (Chapin et al. 1994). In Utah, *Acer negundo* (box-elder) often becomes the dominant canopy species on more xeric sites (Padgett et al. 1989).

Alnus incana fixes atmospheric nitrogen through a symbiotic relationship with the bacteria *Frankenia* and increases the ecosystem nitrogen supply with the deposition of nitrogen-rich leaf litter (Binkley 1986). The annual input of nitrogen to soils from alder species ranges from 10 to 150 times the amount deposited by atmospheric precipitation alone (Binkley 1986, Bowman and Steltzer *in press*). Nitrogen rich detritus is an important source of nutrients for the aquatic ecosystem as well.

In Nevada, Utah, southeastern Idaho, Montana, and Wyoming, the *Alnus incana*/mesic graminoid type is considered a grazing-induced community, derived from the *Alnus incana*/mesic forb plant association (Padgett et al. 1989, Manning and Padgett 1995, Jones 1992c). In Colorado, most stands of this plant association appear to be disturbed by improper grazing and have an abundance of non-native graminoid species. A few stands, however, appear undisturbed and have an undergrowth dominated by native grasses.

MOST ABUNDANT SPECIES

Florissant Fossil Beds NM

Stratum	Species
Shrub	*Alnus incana*
Graminoid	*Carex nebrascensis, Phalaris arundinacea*
Forb	*Cirsium scariosum, Iris missouriensis*

Global

Stratum	Species
Shrub	*Alnus incana*
Graminoid	*Calamagrostis canadensis, Carex* spp., and *Equisetum* spp.
Forb	*Mertensia ciliata, Achillea millefolium, Taraxacum officinale*

CHARACTERISTIC SPECIES

Florissant Fossil Beds NM

Stratum	Species
Shrub	*Alnus incana, Salix monticola, Salix exigua*
Graminoid	*Carex nebrascensis, Phalaris arundinacea, Poa pratensis*
Forb	*Mertensia ciliata, Heracleum maximum, Cirsium scariosum*

Global

Stratum	Species
Shrub	*Alnus incana,*
Graminoid	*Calamagrostis canadensis, Carex* spp., and *Equisetum* spp.
Forb	*Mertensia ciliata, Achillea millefolium, Taraxacum officinale*

OTHER NOTEWORTHY SPECIES

Florissant Fossil Beds NM

Global

Stratum	Species

GLOBAL SIMILAR ASSOCIATIONS:

SYNONYMY:

- DRISCOLL FORMATION CODE:III.B.3.c. (Driscoll et al. 1984) B
- *Alnus incana*/Mesic graminoid (Bourgeron and Engelking 1994) =
- *Alnus incana* / Mesic forbs (Padgett et al. 1989). a grazing-induced sere.
- *Alnus incana* / Mesic forbs (Manning and Padgett 1995). a grazing-induced sere.
- *Alnus incana / Glyceria elata*. Oregon.
- *Alnus incana / Calamagrostis canadensis*. Oregon.
- *Alnus incana / Scirpus microcarpus*. Oregon.
- *Alnus incana / Carex amplifolia*. Oregon.
- *Alnus incana / Carex pellita*. Oregon.

GLOBAL STATUS AND CLASSIFICATION COMMENTS

Global Conservation Status Rank: G3.

Global Classification Comments: Classification is based on data collected from throughout the range of the association. Some classifications have considered this a grazing-induced sere of the *Alnus incana* / Mesic Forbs Shrubland (CEGL001147) (Padgett et al. 1989, Manning and Padgett 1995). High-quality stands with a native understory are uncommon, but are reported in Colorado and Idaho, and are suspected in Wyoming. In Oregon, five *Alnus incana* plant associations (*Alnus incana / Glyceria elata, Alnus incana / Calamagrostis canadensis, Alnus incana / Scirpus microcarpus, Alnus incana / Carex amplifolia*, and *Alnus incana / Carex pellita)* were described and one or more may belong in this association.

ELEMENT DISTRIBUTION

Florissant Fossil Beds NM Range: Stands of *Alnus incana* / Mesic Graminoids Shrubland occur only in two minor drainages tributary to Grape Creek. Both drainages are on the eastern portion of the monument above 8500 feet elevation (8520–8550 feet) in nearly flat to moderately steep topography (1–12%). As a result, the stands are poorly drained to moderately well-drained. The northernmost drainage lies adjacent to the trail running along the northeastern monument boundary; the southernmost is near the southeastern monument boundary.

Global Range: This plant association is a minor riparian type in Idaho, Colorado, Utah, Wyoming, and Nevada.

Nations: US
States/Provinces: CO ID NV UT WY

ELEMENT SOURCES

Florissant Fossil Beds NM Inventory Notes: Plots 17, 80
Classification Confidence: 2 **Identifier:** CEGL001148

REFERENCES: Binkley 1986, Bourgeron and Engelking 1994, Bowman and Steltzer n.d., Chapin et al. 1994, Driscoll et al. 1984, Hansen et al. 1988b Hansen et al. 1989, Jones 1992b, Jones 1992c, Kettler and McMullen 1996, Kittel et al. 1996, Kittel et al. 1999, Manning and Padgett 1995, Padgett et al. 1989, Richard et al. 1996, Rosgen 1996, Van Cleve et al. 1971, Viereck 1970